

batteries, for a total voltage of 48. The battery pack provides capacity of 1110 ampere hours or about 18-20 hours of back-up power to the home. It is contemplated that the battery pack will typically not drop below 80% state of charge (SOC).

[0050] While particular embodiments and aspects of the present invention have been illustrated and described herein, various other changes and modifications may be made without departing from the spirit and scope of the invention. Moreover, although various inventive aspects have been described herein, such aspects need not be utilized in combination. It is therefore intended that the appended claims cover all such changes and modifications that are within the scope of this invention.

What is claimed is:

1. A portable clean power generation and aggregation system, the system comprising:

- a plurality of power generation units operable to generate DC electrical power, further comprising
 - a solar power generation unit, comprising a solar power generator, a solar power generator controller, and a current and voltage sensor;
 - a wind power generation unit, comprising a wind power generator, a wind power generator controller, and a current and voltage sensor;
 - a hydro power generation unit, comprising a hydro power generator, a hydro power generator controller, and a current and voltage sensor;
 - a fuel-based power generation unit, comprising a fuel-based power generator, a fuel-based power generator controller, and a current and voltage sensor;
- a power storage device electrically coupled to the plurality of power generation units and capable of storing DC electrical power generated by the plurality of power generation units;
- an inverter unit, comprising an inverter and an inverter controller, wherein the inverter unit is electrically coupled to the plurality of power generation units and the power storage device and wherein the inverter converts DC electrical power into AC electrical power; and
- a main controller, wherein the main controller is electrically coupled to the plurality of power generation units, the inverter controller, and the power storage device, whereby the main controller can monitor DC electrical power generation by the plurality of power generation units, can monitor DC electrical power received by the inverter, can measure charge of the power storage device and direct DC electrical power from the power storage device to the inverter, and can send electronic signals to selectively activate one or more of the plurality of power generation units, and whereby DC electrical power generated by the plurality of power generation units is aggregated between the plurality of power generation units and the inverter unit.

2. The system of claim 1, further comprising a DC current surge protector electrically coupled to the plurality of power generation units, the power storage device, and the inverter.

3. The system of claim 1, further comprising a DC current breaker electrically coupled to the plurality of power generation units, the power storage device, and the inverter.

4. The system of claim 1, further comprising an AC current breaker electrically coupled to the inverter.

5. The system of claim 1, further comprising a local display electrically coupled to the main controller.

6. The system of claim 1, further comprising a remote management mechanism coupled to the main controller.

7. The system of claim 6, wherein the remote management mechanism comprises wireless telecommunications.

8. The system of claim 1, wherein the system is electrically coupled to a local network.

9. The system of claim 1, wherein the system is electrically coupled to a distribution grid.

10. The system of claim 9, wherein the distribution grid is a public power grid.

11. The system of claim 1, wherein the inverter comprises an off-the-grid inverter.

12. The system of claim 1, wherein the inverter comprises a grid tie-in inverter.

13. The system of claim 1, wherein the wind power generator is a wind turbine.

14. The system of claim 13, wherein the wind turbine is a vertically-oriented wind turbine.

15. The system of claim 1, wherein the hydro power generator comprises a turbine.

16. The system of claim 15, wherein the turbine is a helical turbine.

17. The system of claim 15, wherein the turbine is a vertically-oriented turbine.

18. The system of claim 15, wherein the turbine is a horizontally-oriented turbine.

19. The system of claim 1, wherein the hydro power generator is suspended by a buoy.

20. The system of claim 1, wherein the fuel-based power generator comprises a natural gas power generator.

21. The system of claim 1, wherein the power storage device is a battery pack.

22. The system of claim 21, wherein the battery pack comprises multiple batteries.

23. The system of claim 1, wherein the portable clean power generation and aggregation system is capable of being transported in a 16-foot or shorter trailer.

24. The system of claim 1, wherein the system is capable of being electrically coupled to a second portable clean power generation and aggregation system such that the system and the second portable clean power generation and aggregation system operate in parallel.

25. The system of claim 24, further comprising a connector which is capable of electrically coupling the system to the second portable clean power generation and aggregation system.

26. The system of claim 1, wherein the system is capable of providing a wireless signal to transmit information to a portable wireless device.

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